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**Declaration under Rule 4.17:**

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: GLYCOPEPTIDE ANTIBIOTIC AND SEMISYNTHETIC DERIVATIVES THEREOF AND THEIR USE AS ANTIVIRAL AGENTS

(57) Abstract: Novel glycopeptide antibiotic derivatives, processes for their preparation, their use as a medicine, their use to treat or prevent viral infections and their use to manufacture a medicine to treat or prevent viral infections are provided. The present invention relates to the use of glycopeptide antibiotics and their semisynthetic derivatives to treat or prevent viral infections and their use to manufacture a medicine to treat or prevent viral infections of subjects, more in particular infections with viruses belonging to Retroviridae, Herpes viridae, Flaviviridae and the Coronaviridae, like HIV (human immunodeficiency virus), HCV (hepatitis C virus), BVDV (bovine viral diarrhoea virus), SARS (severe acute respiratory syndrome) causing virus, FCV (feline coronavirus), HSV (herpes simplex virus), VZV (varicella zoster virus) and CMV (cytomegalovirus).



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# INTERNATIONAL SEARCH REPORT

10/525784

International Application No.  
PCT/DE 03/00144

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61K38/14 C07K9/00

Rec'd PCT/PTO 28 FEB 2005

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61K C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, MEDLINE, EMBASE, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GEORGIU NIKI A ET AL: "The chemotherapeutic agent bleomycin in a two-drug combination with zidovudine, ritonavir or indinavir synergistically inhibits HIV Type-1 replication in peripheral blood lymphocytes" INTERNATIONAL JOURNAL OF ANTIMICROBIAL AGENTS, vol. 18, no. 6, December 2001 (2001-12), pages 513-518, XP002265326 ISSN: 0924-8579	1-3
Y	Table 1, Abstract, page 514, left column, first sentence in second paragraph  --- -/--	4-22

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

27 May 2004

Date of mailing of the international search report

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# INTERNATIONAL SEARCH REPORT

.....al Application No

PCT/BE 03/00144

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SINGH S B ET AL: "The complestatins as HIV-1 integrase inhibitors. Efficient isolation; structure elucidation, and inhibitory activities of isocomplestatin, chloropectin I, new complestatins, A and B, and acid-hydrolysis products of chloropectin I." JOURNAL OF NATURAL PRODUCTS. UNITED STATES JUL 2001, vol. 64, no. 7, July 2001 (2001-07), pages 874-882, XP002265327 ISSN: 0163-3864	1-3
Y	Figure 1 and Table 2/3, related text	4-22
X	----- MALABARBA A ET AL: "STRUCTURAL MODIFICATIONS OF GLYCOPEPTIDE ANTIBIOTICS" MEDICINAL RESEARCH REVIEWS, NEW YORK, NY, US, vol. 17, no. 1, 1997, pages 69-137, XP002928119 ISSN: 0198-6325 cited in the application	10,11
Y	Figures	10-22
Y	----- ALLEN NORRIS E ET AL: "Hexapeptide derivatives of glycopeptide antibiotics: Tools for mechanism of action studies" ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, vol. 46, no. 8, August 2002 (2002-08), pages 2344-2348, XP002265328 ISSN: 0066-4804 Abstract, Figs.	4-22
X	----- EP 0 365 319 A (LILLY CO ELI) 25 April 1990 (1990-04-25)	10,11
Y	Table I, claims, examples	10-22
X	----- EP 0 667 353 A (LILLY CO ELI) 16 August 1995 (1995-08-16)	10,11
Y	Table IIa, claims, examples	10-22
X	----- WO 01/81372 A (UNIV PRINCETON) 1 November 2001 (2001-11-01)	10,11
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Y	claims, examples, Tables III and IV	11-22
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## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/BE 03/00144

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/69893 A (MERCK & CO INC ;UNIV PRINCETON (US)) 23 November 2000 (2000-11-23) cited in the application	10,11
Y	Tables 3-5, claims, examples	11-22
X	----- BORGHI A ET AL: "MICROBIAL DE-MANNOSYLATION AND MANNOSYLATION OF TEICOPLANIN DERIVATIVES" JOURNAL OF ANTIBIOTICS, JAPAN ANTIBIOTICS RESEARCH ASSOCIATION. TOKYO, JP, vol. 44, no. 12, December 1991 (1991-12), pages 1444-1451, XP009023200 ISSN: 0021-8820 the whole document	10-16,22
X	----- MALABARBA A NICAS TI CIABATTI R: "Glycopeptide resistance in multiple antibiotic-resistant Gram-positive bacteria: a current challenge for novel semi-synthetic glycopeptide derivatives" EUROPEAN JOURNAL OF MEDICINAL CHEMISTRY, EDITIONS SCIENTIFIQUE ELSEVIER, PARIS, FR, vol. 32, no. 6, 1 June 1997 (1997-06-01), pages 459-478, XP004088458 ISSN: 0223-5234 the whole document	10-16,22
X	----- MALABARBA A ET AL: "TEICOPLANIN, ANTIBIOTICS FROM ACTINOPLANES TEICHOMYCETICUS NOV. SP. VII. PREPARATION AND NMR CHARACTERISTICS OF THE AGLYCON OF TEICOPLANIN" JOURNAL OF ANTIBIOTICS, JAPAN ANTIBIOTICS RESEARCH ASSOCIATION. TOKYO, JP, vol. 39, no. 10, October 1986 (1986-10), pages 1430-1442, XP009025778 ISSN: 0021-8820 the whole document	10-16,22
X	----- EP 0 276 740 A (LEPETIT SPA) 3 August 1988 (1988-08-03) claims, examples	10-16,22
X	----- US 5 500 410 A (MALABARBA ADRIANO ET AL) 19 March 1996 (1996-03-19) claims, examples	10-16,22
X	----- US 5 521 155 A (MALABARBA ADRIANO ET AL) 28 May 1996 (1996-05-28) claims, examples -----	10-16,22

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/BE 03/00144

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 1-22 (all in part)  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
1-22 (all in part)
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

Continuation of Box I.2

Claims Nos.: 1-22 (all in part)

1-22 (all in part): Compounds falling within Formula III have not been searched, because the third fee has not been payed. Caused by particular structural differencies the search of compounds according to Formula III requires a completey different search strategy than the search made for the compounds falling within Formula I and II.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-22 (all in part)

Use of a glycopeptide antibiotic and derivatives for the manufacture of a medicament for the treatment of the prevention of viral infections (claims 1-9, in part), glycopeptides of Formula I (claims 10-13, in part) and their first (claim 22, in part) and second medical use (claim 17, in part), compositions (claims 14,15 in part) and use of such compositions (claims 16 in part) according to claim 10, a method for preventing or treatment of viral infections (claims 18-19) using glycopeptides of Formula I and a method for screening antiviral compounds.

2. Claims: 1-22 (all in part)

Use of a glycopeptide antibiotic and derivatives for the manufacture of a medicament for the treatment of the prevention of viral infections (claims 1-9, in part), glycopeptides of Formula II (claims 10-13, in part) and their first (claim 22, in part) and second medical use (claim 17, in part), compositions (claims 14,15 in part) and use of such compositions (claims 16 in part) according to claim 10, a method for preventing or treatment of viral infections (claims 18-19) using glycopeptides of Formula II and a method for screening antiviral compounds.

3. Claims: 1-22 (all in part)

Use of a glycopeptide antibiotic and derivatives for the manufacture of a medicament for the treatment of the prevention of viral infections (claims 1-9, in part), glycopeptides of Formula III (claims 10-13, in part) and their first (claim 22, in part) and second medical use (claim 17, in part), compositions (claims 14,15 in part) and use of such compositions (claims 16 in part) according to claim 10, a method for preventing or treatment of viral infections (claims 18-19) using glycopeptides of Formula III and a method for screening antiviral compounds.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/BE 03/00144

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Information on patent family members

International Application No

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International Application No

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